

## Claims

1. A polymer dispersion, **characterized** in that it consists of the following components, based on the solids content of the product:

- 5 a) from 5 to 50%, preferably from 5 to 40% of starch with a degree of substitution (DS), relative to the cationic or anionic substituents, of from 0.01 to 1 and an intrinsic viscosity, when cationized and/or anionized, of  $> 1.0$  dl/g,
- 10 b) from 50 to 95%, preferably from 60 to 95%, of a monomer mixture comprising at least one vinyl monomer,

the film forming temperature of the polymer, which comprises these components, being from  $-50$  to  $200^{\circ}\text{C}$ , preferably from  $0$  to  $100^{\circ}\text{C}$ , more preferably from  $0$  to  $70^{\circ}\text{C}$  and most preferably from  $10$  to  $50^{\circ}\text{C}$ , and

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c) water.

2. The polymer dispersion according to claim 1, **characterized** in that the degree of substitution of the starch is from  $0.04$  to  $1.0$  and the intrinsic viscosity is from  $1.5$  to  $15$  dl/g.

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3. The polymer dispersion according to claim 1 or 2, **characterized** in that the film forming temperature of the polymer formed from the monomer mixture is from  $10$  to  $50^{\circ}\text{C}$ , preferably from  $20$  to  $50^{\circ}\text{C}$ .

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4. The polymer dispersion according to any one of claims 1 to 3, **characterized** in that the monomer mixture consists of from  $40$  to  $70\%$  of acrylates and from  $30$  to  $60\%$  of styrene.

30 5. The polymer dispersion according to any one of claims 1 to 3, **characterized** in that it consists of

- from  $5$  to  $50\%$ , preferably from  $5$  to  $40\%$  of starch,  
from  $0$  to  $19\%$  of acrylonitrile,  
35 from  $10$  to  $60\%$  of acrylates and  
from  $10$  to  $60\%$  of styrene,

and water.

6. The polymer dispersion according to claim 5, **characterized** in that it consists of

40 of from  $15$  to  $40\%$ , preferably from  $15$  to  $35\%$  of starch,  
from  $5$  to  $19\%$  of acrylonitrile,  
from  $20$  to  $50\%$  of acrylates and  
from  $20$  to  $40\%$  of styrene,  
and water.

45 7. The polymer dispersion according to claim 1, **characterized** in that it consists of

20% of starch with a degree of substitution of about  $0.05$  and an  
intrinsic viscosity of from  $3$  to  $15$  dl/g,  
50 19% of acrylonitrile,

30% of acrylates and  
31% of styrene,  
and water.

- 5 8. A process for producing the polymer dispersion according to claim 1,  
**characterized** in that a monomer mixture comprising at least one vinyl  
monomer is copolymerized in an aqueous solution of a starch, and the polymer  
thus formed has a film forming temperature of from -50 to 200°C, preferably  
10 from 0 to 100°C, more preferably from 0 to 70°C and most preferably from  
10 to 50°C.
9. The process according to claim 8, **characterized** in that the starch is  
dissolved in an aqueous alkaline solution at a temperature of over 60°C.
- 15 10. The process according to claim 8, **characterized** in that during the  
polymerization, the temperature is from 70 to 90°C and the pH is below 7.
11. The process according to claim 8, **characterized** in that an anionized and/or  
20 a cationized starch is used.
12. The use of the polymer dispersion according to any one of the claims from  
1 to 7 in paper manufacture.
- 25 13. The use of the polymer dispersion according to any one of the claims from  
1 to 7 as a surface sizing additive for paper.
14. The use of the polymer dispersion according to any one of the claims from  
1 to 7 as a wet- and dry-strengthener for paper which is added to the wet end  
30 of the paper machine.
15. The use of the polymer dispersion according to any one of the claims from  
1 to 7 as a pulp size.